

## PATENT SPECIFICATION

(11)

1 380 706

1 380 706

(21) Application No. 59276/71

(22) Filed 21 Dec. 1971

(19)

(23) Complete Specification filed 11 Jan. 1973

(44) Complete Specification published 15 Jan. 1975

(51) INT. CL.<sup>2</sup> H01R 13/10 13/40 15/10

(52) Index at acceptance

H2E 10B 3A2 3B7 3C6D2 3D4  
B5A 1R39E

(72) Inventor GRAHAM ROWLAND WORMLEIGHTON

(54) AN IMPROVED SOCKET FOR PIN AND SOCKET CONNECTIONS AND A  
METHOD OF MAKING SAME

(71) We, PRESSAC LIMITED, a British Company of Harrington Mills, Leopold Street, Long Eaton, Nottingham, NG10 4QL, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to an improved moulded-on socket for an electric pin and socket connection and a method of making same and more particularly, although not exclusively, concerns a socket adapted to be secured to an end of an electric lead.

The term "moulded-on socket" means a socket encased or embedded in insulating material so as to eliminate the presence of outwardly facing exposed surfaces of the metal of the contact.

Conventional moulding-on requires that no moulding material enters the contact face area within the socket for two reasons:—

- (1) it can cause poor electrical contact
- (2) because if the moulding material is not properly bonded to the contact any film or flash of moulding material can become detached during insertion of the mating pin and thus interfere with the insertion of the pin.

A further difficulty experienced with conventional moulded-on connectors is that when the mating pin is inserted the female socket of necessity expands so causing the seam of the socket to open and there is a tendency for the surrounding moulding material to creep into this gap so preventing the socket from closing to the proper size when the mating pin is withdrawn.

The object of the invention is the provision of a "moulded-on" connector or socket which is itself adequately insulated and adapted to make a highly efficient electrical connection with a conductor pin inserted therein.

According to the present invention there is provided a moulded-on socket for an electric pin and socket connection which comprises a trough-like contact part of electrically conductive metal which has internally and externally moulded thereabout a sleeve of electric insulating material, the wall of said metal contact being formed with openings through which the insulating material can flow during moulding to form keys which firmly join the material inside the contact to that outside the contact so that the material inside the contact cannot become detached and interfere with the insertion of a contact pin, the inner face of the contact having portions left uncovered by the insulating material for establishing an electric connection with a mating electric contact pin when the latter is inserted into the socket.

The invention also provides a method of producing an electric socket constructed in accordance with the preceding paragraph which consists in temporarily inserting into said trough-like part a moulding core having a diameter very slightly larger than that of a pin intended to be used in conjunction with the socket, and moulding said insulating material about said trough-like part so as to form a sleeve therearound and during which the insulating material, while fluid, flows through the holes in the wall of the trough-like part to form keys that firmly join the insulating material passing to the inside of the trough to that outside the trough but leaving uncovered those parts of the inner faces of the trough-like part which are in contact with the temporarily inserted moulding core and which are to constitute contact faces intended to be engaged by a contact pin to be used with the socket.

According to a preferred embodiment of the invention the edges of the two sides of the mouth of the trough are intumed and make line contact with the moulding core and so remain uncovered by the insulation so as to constitute two parallel surfaces to

50

55

60

65

70

75

80

85

90

be contacted by a contact pin. A third pin-contacting surface is constituted by forming the base of the trough-like part with an indented rib which projects into the interior of said trough-like part and makes line contact with the moulding core so as to leave a third surface not covered by insulation and so left exposed for engagement by a contact pin.

To enable the invention to be clearly understood a preferred embodiment thereof will now be described by way of example with reference to the drawings accompanying our Provisional Specification, wherein:—

Figure 1 is a side elevation of the trough-like metal part of the socket.

Figure 2 is a view looking towards the outside of the base of the socket.

Figure 3 is a transverse section taken on the line A—A of Figure 1.

Figure 4 is a perspective view showing the trough-like member clenched to a lead.

Figure 5 is a part sectional side view drawn to a larger scale showing the trough-like part encased in insulation and with the moulding core still in position.

Figure 6 is a transverse section taken on the line B—B of Figure 5, and

Figure 7 is a longitudinal section taken in a plane at right angles to Figure 5.

Referring to said drawings, the trough-like contact part of the socket is indicated generally at 1 and is formed with tongues 2 and 3 for clenching respectively to a core 4 and insulation 5 of an electrical lead.

As clearly shown in the drawings, the portions of the wall of the trough-like member are formed at opposite sides with holes 6 through which can flow insulation which is in a fluid state as the trough-like part 1 is being encased in a sleeve 7 (Figures 5 and 6) during a moulding operation when the socket is being made.

As clearly shown in Figures 3 and 6 the edges 8 of the two sides of the mouth of the trough are intumed and make line contact with a moulding core pin 9 which is temporarily inserted axially into said trough-like part prior to the moulding of the insulating sleeve 7 there-around. This core is of very slightly larger diameter than that of an electric contact pin (not shown) intended to be used in conjunction with the socket. During moulding, see Figures 5, 6 and 7 material flows around and also inside the contact 1 from both ends through the holes 6 resulting in the contact part 1 being completely immersed in moulding material with the exception of three parts touching the core pin, i.e. the two edges 8 and an elongated indented rib 11 in the base of the part 1 which projects into the interior of said trough-like part, the edges 8 and rib 11 defining spaces 10 into which the moulding material flows. The result is that there

is formed a tube of moulding material inside the contact that cannot become detached and interfere with the insertion of an electric contact pin because the material inside is firmly joined to the material outside at both ends of the contact and additionally through being keyed and firmly joined to the material outside the contact by the material filling the holes 6.

It will be readily appreciated that as the edges 8 and the inner face of said rib 11 make surface contact with said core that the metal of said edges and said rib are left uncovered by the insulating material of the sleeve 7 so that when the core is withdrawn the interior of the insulated pocket comprises three axially directed parallel exposed portions of said trough-like part which are engaged and make electrical contact with a contact pin proper when the latter is inserted into said socket.

The said trough-like part may be produced in accordance with known methods e.g. in strip form or bandolier fashion from which the like parts are separated, the said parts however, for the purpose of the present invention being formed with said holes 6.

#### WHAT WE CLAIM IS:—

1. A moulded-on socket for an electric pin and socket connection comprising a trough-like contact part of electrically conductive metal which has internally and externally moulded thereabout a sleeve of electric insulating material, the wall of said metal contact being formed with openings through which the insulating material can flow during moulding to form keys which firmly join the material inside the contact to that outside the contact so that the material inside the contact cannot become detached and interfere with the insertion of a contact pin, the inner face of the contact having portions left uncovered by the insulating material for establishing an electric connection with a mating electric contact pin when the latter is inserted into the socket.

2. A method of producing an electric socket as claimed in Claim 1, consisting in temporarily inserting into said trough-like part a moulding core having a diameter very slightly larger than that of a pin intended to be used in conjunction with the socket, and moulding said insulating material about said trough-like part so as to form a sleeve therearound and during which the insulating material, while fluid, flows through the holes in the wall of the trough-like part to form keys that firmly join the insulating material passing to the inside of the trough to that outside the trough but leaving uncovered those parts of the inner faces of the trough-like part which are in contact with the temporarily inserted mould-

ing core and which are to constitute contact faces intended to be engaged by a contact pin to be used with the socket.

- 5 3. The method claimed in Claim 2, wherein the edges of the two sides of the mouth of the trough are intumed and make line contact with the moulding core and so remain uncovered by the insulation so as to constitute two parallel surfaces to be con-
- 10 tacted by a contact pin.

4. The method claimed in Claim 2 or 3, which consists in forming the inner surface of the contact with a third pin-contacting surface by forming the base of the trough-like part with an indented rib which projects
- 15 into the interior of said trough-like part and

makes line contact with the moulding core so as to leave a third surface not covered by insulation and so left exposed for engagement by a contact pin.

5. A moulded-on socket for an electric pin and socket connection and a method of making same substantially as hereinbefore described with reference to and as illustrated by the drawings accompanying our Provi-
- 25 sional Specification.

6. A moulded-on socket made in accordance with any of the preceding Claims.

HERBERT J. W. WILDBORE,  
52/54 Featherstone Street,  
London, EC1Y 8ST,  
Agent for the Applicants.

Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1975.  
Published at The Patent Office, 25 Southampton Buildings, London, WC2A 1AY  
from which copies may be obtained.

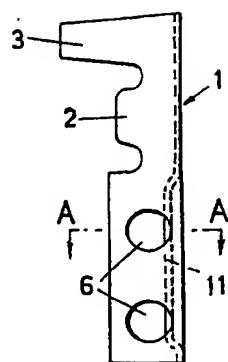


FIG. 1.

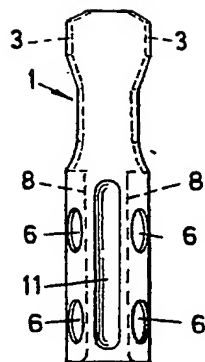


FIG. 2.

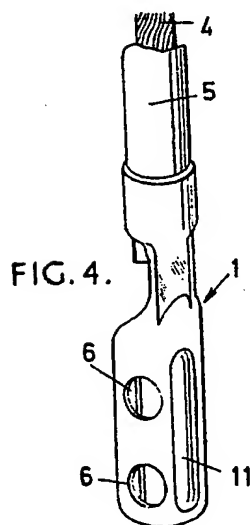


FIG. 4.

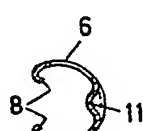


FIG. 3.

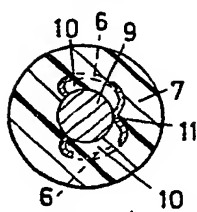


FIG. 6.

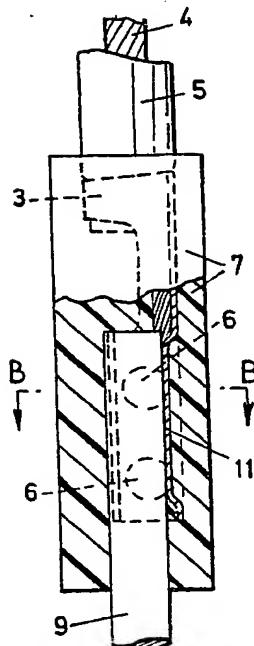


FIG. 5.

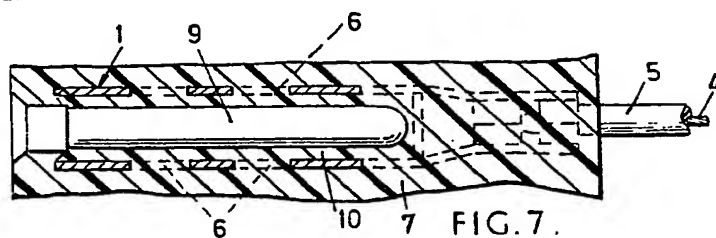


FIG. 7.